

Date: 2 / 1 / 2016

Time: 2 hrs.

(70 Marks)

Chemistry department
Faculty of Science
Damanshour University

Exam in the Spectroscopy (C441)

Answer the following questions:

[1] Select the correct answer for each of the following statements:

16 Marks

(i) The number of peaks in the ^{13}C -NMR spectrum of 1,4-dimethylbenzene is:

- a) Two b) three c) four d) five

(ii) The ^1H -NMR spectrum of diethyl ether shows?

- a) two peaks, one a triplet, the other a quartet b) four peaks, all doublets
c) two peaks, one a triplet, the other a doublet d) four peaks, all triplets

(iii) Four $\text{C}_{10}\text{H}_{14}$ isomers are named below. Which of these would display the following ^1H -NMR signals? δ 1.22 (t) 6H, δ 2.60 (q) 4H, δ 7.12 (s) 4H

(s=singlet, d=doublet, t=triplet, q=quartet, m=multiplet).

- a) tert-butylbenzene. b) isobutylbenzene
c) para-diethylbenzene. d) 1,2,3,4-tetramethylbenzene.

(iv) Which if any of the following compounds will display spin-spin splitting in the ^1H -NMR?

- a) $(\text{CH}_3)_3\text{CCOCH}_3$ b) $\text{Br}(\text{CH}_2)_3\text{Br}$
c) CH_3OCH_3 d) none of these

[2] How IR spectroscopy can be used to distinguish each pair of the following:

i) $\text{CH}_3\text{CH}_2\text{-OH}$ and CH_3OCH_3

ii) $\text{C}_6\text{H}_5\text{NHCH}_3$ and $\text{C}_6\text{H}_5\text{CONH}_2$

14 Marks

[3] How could you distinguish between each pair of the following based on the number of signals in the ^{13}C -NMR spectrum.

14 Marks

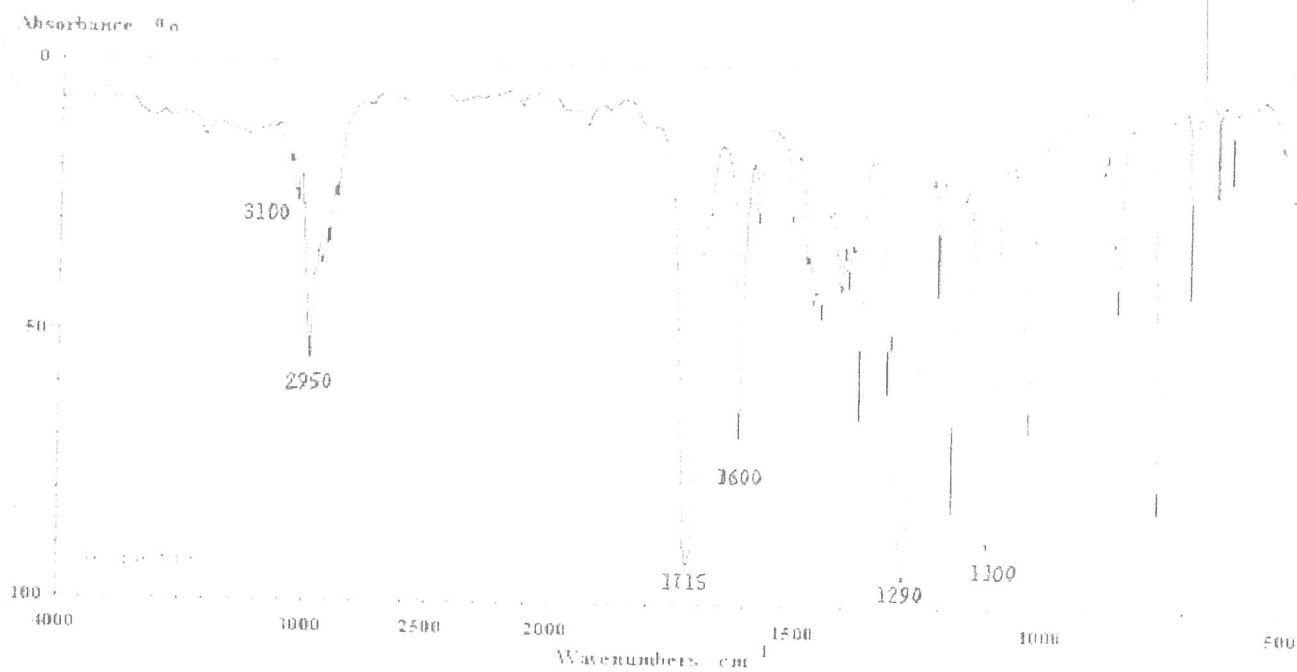
a) CH_3COCH_3 and $\text{CH}_3\text{COOCH}_3$

b) $\text{CH}_3\text{CH}_2\text{CH=CHCH}_2\text{CH}_3$ and $\text{CH}_3\text{CH=CHCH}_2\text{CH}_2\text{CH}_3$

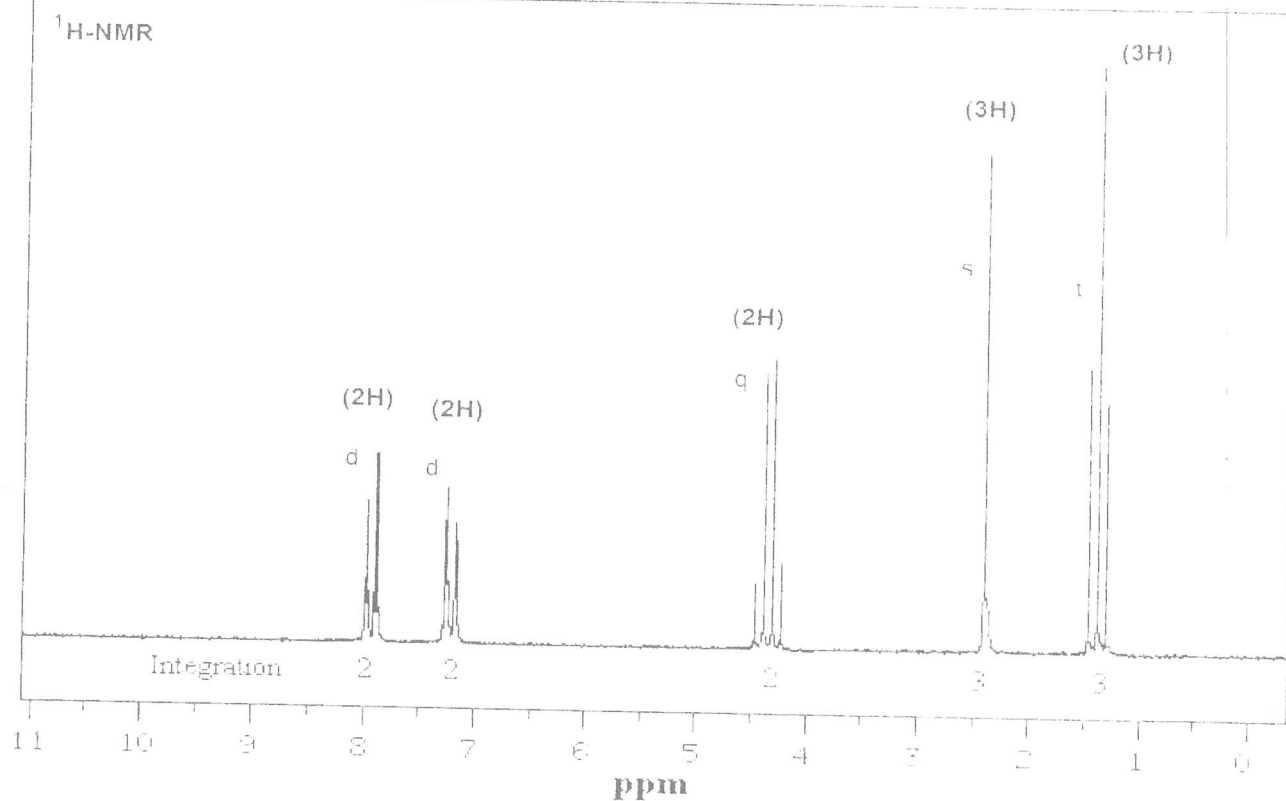
[4] Predict the structural formula for a compound of molecular formula $C_{10}H_{12}O_2$ and give reasons.

26 Marks

IR



1H -NMR



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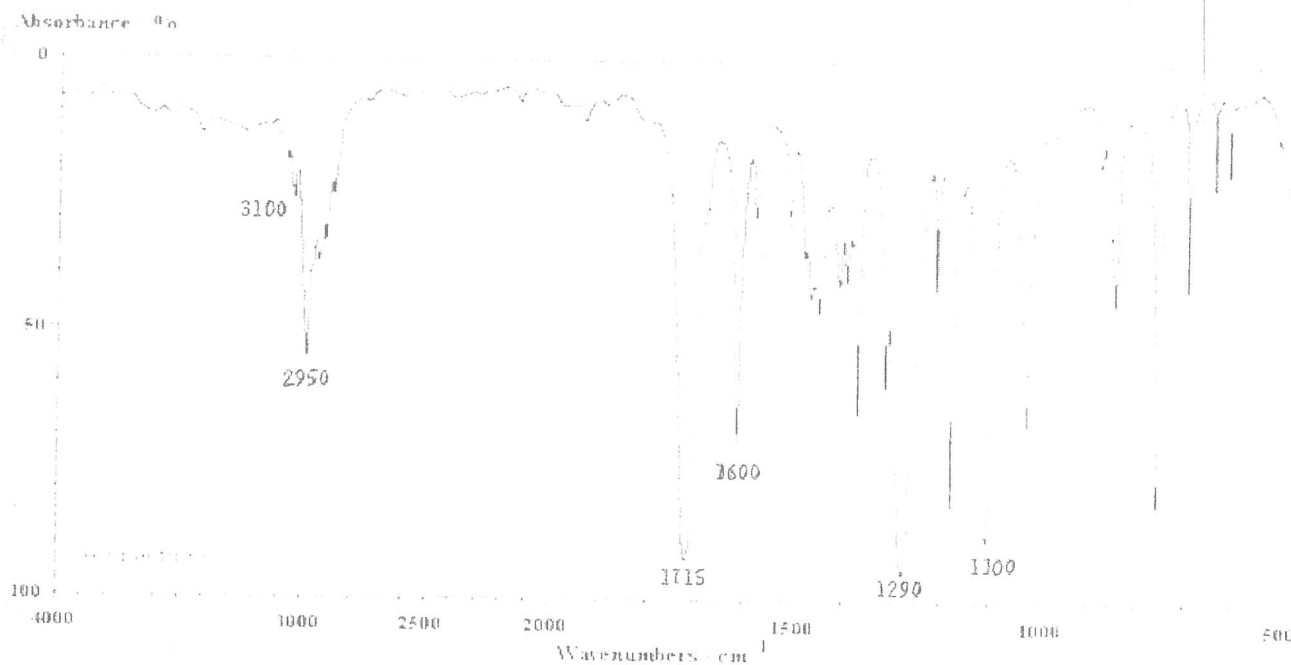
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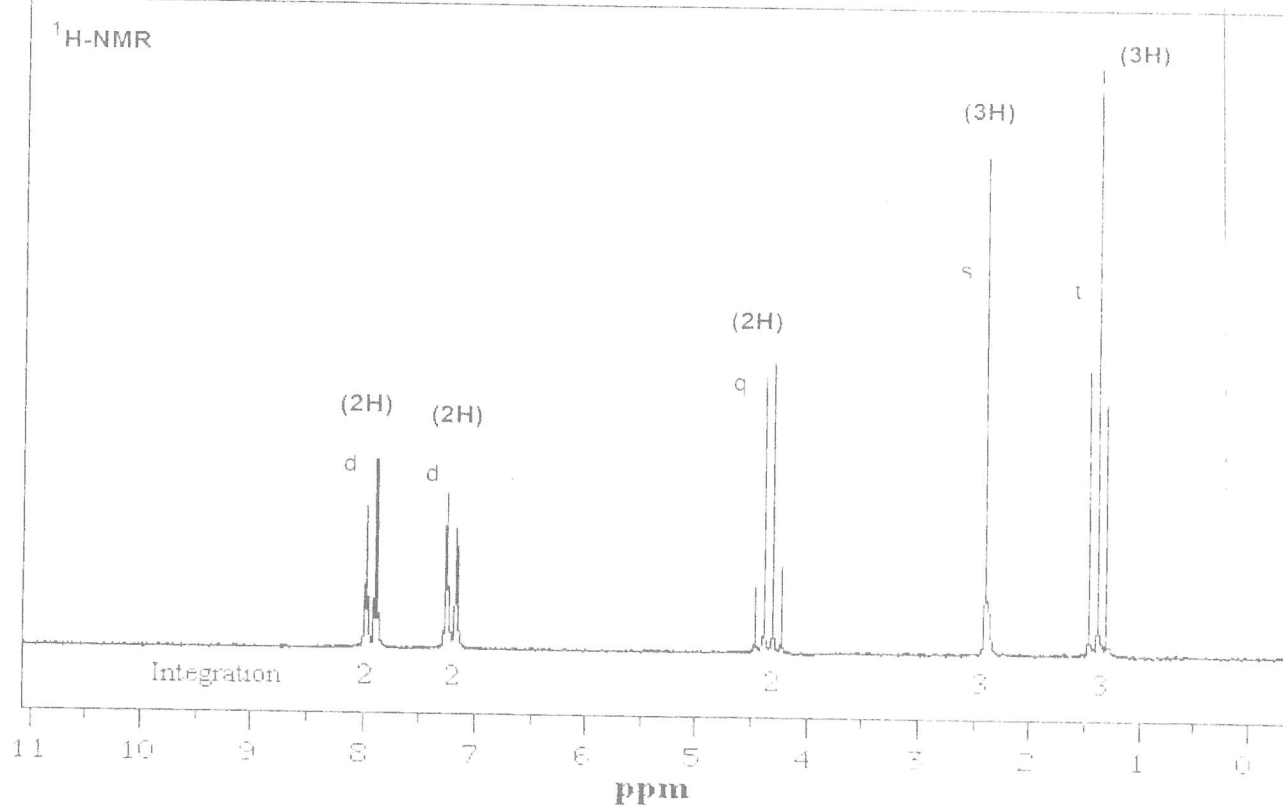
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26 Marks

IR



1H -NMR



Answer the following questions

Question 1: Write short notes on: (30 marks)

- 1- Wilhelmy plate method for surface tension determination
- 2- Factors affecting c.m.c
- 3- Steps of heterogeneous catalysis
- 4- Spreading of one liquid on another
- 5-Specific acid-catalysis
- 6- Comparison between physical adsorption and chemical adsorption.

Question 2:

(A) Define the following terms: (40 marks)

- | | | |
|-------------------------|-----------------------|----------------|
| 1- Surface tension | 3- Catalyst modifiers | |
| 2- Homogenous catalysis | 4- Lewis acid | 5- Surfactants |

(B) Show with diagram only:

- 1- Effect of different alcohols on surface tension
- 2- Effect of surfactant concentration on physical properties of solution
- 3- Type I and type II adsorption isotherms
- 4- Contributions to an oil-water interfacial tension (with equation)
- 5-Work of adhesion and of cohesion

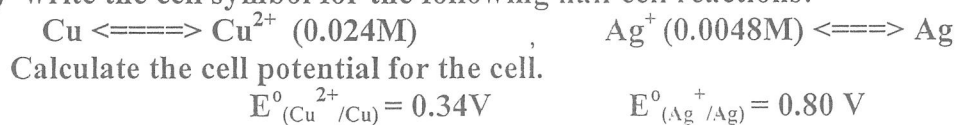
With my best wishes

Dr/A.F.Hassan



Answer the following questions:

Q1) write the cell symbol for the following half cell reactions:



Q2) How much charge is required to reduce 1 mole of Cd^{2+} to Cd, $F = 96500$ coulomb.

Q3) An electric current of 100 ampere is passed through a molten liquid of sodium chloride for 5 hours. Calculate the volume of chlorine gas liberated at the electrode at STP.

Q4) Compare between batteries and fuel cells?

Q5) Discuss the methods of surface tension measurements.

Q6) Give a brief on classification of surfactance.

Q7) What are the factors that affect the critical micelle concentration?

Best Wishes

Examination for (Ch 221)
Course Title: Biomolecules
Date: 14/12/2015
Time Allowed: 2 hour
Total Assessment Marks: 70 marks

Damanhor University
Faculty of science
Department of biochemistry

All questions should be answered

- 1- Give an account on rancidity. (10 marks)
- 2- Give an account on the essential fatty acids. (10 marks)
- 3- What are the functions of cholesterol? (10 marks)
- 4- Compare between the following : (10 marks)
 - A- alpha and beta lipoprotein.
 - B- Neutral fat and wax.
- 5- Discuss Geometrical isomerism (10 marks)
- 6- Structure and properties of maltose (10 marks)
- 7- Enumerate the essential amino acids. (10 marks)

Good luck



Answer the following three questions:

Question No1.

1. Calculate the indicator range of neutralization Reaction
2. Mixture of sodium carbonate and bicarbonate weighed 0.45 gm when titrated with 0.1 N HCl consumed 10.0 ml and 25.0 ml in presence of phenolphthalein and methyl orange as indicator respectively. Calculate the purity % of the Na_2CO_3 in the mixture.

Question No2.

1. Calculate the Molarity of the followings:
 - 4.4 gram NaOH dissolved in 100ml H_2O
 - 25.0 grams of KMnO_4 dissolved in 250 ml distilled H_2O
2. Calculate the pH values of the following solutions
 - 0.01M acetic acid ($K_a = 8.5 \times 10^{-5}$)
 - 0.08 M ammonium hydroxide ($K_b = 8.5 \times 10^{-5}$)

Question No3

1. Specify only one method used to determine the equivalence point of precipitation reactions.
2. Sample of sodium chloride weighed 0.22gm dissolved in 250 ml of distilled water, when titrated with 0.1 N AgNO_3 consumed 40.0ml in presence of K_2CrO_4 as indicator. Calculate the purity % of the sample.

BEST WISHES

[(At. Wt: Na (23), H (1), O (16), Mn (54)]

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BEST WISHES

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Course Title: Biomolecules I
Course code: Biochem 201
Time Allowed: 2 Hour
Points: 70
Professor Name: Dr. Doha M. Beltagy



University: Damanhour
Faculty: Science
Department: Chemistry
Year: Second
Term: 1st Date: 19/01/2016

Answer all the questions

- 1- Draw the chemical structure of (30 points)
 - a- The non-proteinic part in hemocyanin (in spiders & octopus).
 - b- Tripeptide ($\text{NH}_2\text{-M-I-R-COOH}$).
 - c- Thymine nucleotide.

- 2- Write briefly on the different types of anemia with drawing a diagram illustrating normal R.B. Cs. catabolism. (15 points)

- 3- Define:
 - a- Hydropathy with giving an example for using it in medicinal industry. (10 points)
 - b- PKU. (5 points)

- 4- Explain Bohr's effect with discussing the different effectors inside the cell. (10 points)

WITH BEST WISHES



Answer the following questions:

Question No1.

Discuss the outline of an analytical process starting from sampling out, sample treatment, instrumental choosing and reporting the data

Question No2.

Select one of the following Instruments and discuss its technical principle to identify the unknown samples

- H^1 -NMR
- IR
- UV/VIS

Question No3.

Discuss the principle differences between the Gas Chromatography, Ion Chromatography and liquid chromatography and how use each of those instrument to identify:

- Pesticides
- Heavy metal ions
- Anions & Cations

BEST WISHES



Choose the correct answer.

1. absorbs IR radiation emitted by the sun.
a) Biosphere b) Atmosphere c) Lithosphere d) Hydrosphere
2. is a collective term given to all forms of water such as rivers, seas, oceans.
a) Biosphere b) Atmosphere c) Lithosphere d) Hydrosphere
3. Plants, animals and micro-organisms live in a definite zone along with physical factors and form
a) Biosphere b) Atmosphere c) ecosystem d) Hydrosphere
4. cycle involves a continuous exchange of water between seas, atmosphere, land and living animals.
a) Nitrogen b) hydrologic c) Oxygen d) Phosphorus
5. is a substance that does not occur in nature, but introduced by human activity into the environment.
a) Pollutant b) Contaminant c) Receptor d) Sink
6. The medium interacts and retains the long lived pollutant
a) Pollutant b) Contaminant c) Receptor d) Sink
7. $\text{CH}_2\text{O} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$. This equation proved that oxygen is used for
a) Photosynthesis b) Oxidative weathering c) Degradation of organic materials
8. The atmospheric nitrogen is chemically bound to form ammonia by
a) De-nitrification b) Nitrogen fixation c) Nitrate reduction d) Nitrite oxidation
9. Dichloro diphenyl trichloro ethane is an example of
a) Synthetic rubber b) Soap c) Pesticide d) Detergents
10. is not present in the acid rain.
a) CH_3COOH b) H_2SO_4 c) H_2CO_3 d) HNO_3
11. The part that contain useful ozone is layer.
a) Mesosphere b) Troposphere c) Ionosphere d) Stratosphere
12. The reason of alkalinity of water is
a) Carbonic acid b) Salts of weak bases c) Organic acids d) Salts of weak acids
13. Water has density as a liquid at 4°C which restricts vertical circulation in stratified bodies of water.
a) Maximum b) Minimum c) Optimum d) None of these

4. is not green house gas.
a) CH_4 b) CO_2 c) CO d) H_2O
5. Temporary hardness is sometimes called
a) Bicarbonate hardness b) Carbonate hardness c) a,b d) None of these
6. Oxides of sulphur and nitrogen are important pollutants of
a) Water b) Air c) Soil d) All of them
7. Earth is protected from U.V. radiations by
a) Carbon dioxide layer b) Ozone layer c) oxygen layer d) Nitrogen layer
8. The pollutant responsible for ozone holes is
a) CO_2 b) SO_2 c) CO d) CFC
9. Water is often treated with chlorine to
a) Kill germs b) Make sedimentation c) Remove impurities d) Increase oxygen
10. One of the best solutions to get rid of non-biodegradable wastes is
a) Burning b) dumping c) burying d) Recycling
11. Photochemical smog is related to pollution in
a) Air b) Water c) Soil d) All of them
12. Which of the following reacts with hemoglobin of blood and produce toxic effect?
a) CO b) CO_2 c) C_3O_2 d) Oxygen
13. Green chemistry refers to
a) Chemistry of plants b) Chemistry of green pigments c) Chemistry of geen house effect
d) Development of chemical products and processes less harmful to humans
14. The best device to identify a mixture of gases is
a) GS chromatography b) pH-meter c) Spectrophotometer d) none of them
15. is present in waste water as hexavalent and trivalent species.
a) Lead b) Mercury c) Chromium d) Cadmium

🔔 GOOD LUCK

Damahour University
 Faculty of Science
 Chemistry Department
 Date: 12/1/2016
 Dr: Gehan S. Elasala



Representative Elements
 Second year students
 Course Code: Chem 231
 Time allowed: 2 hours
 Total points: 70

I- Complete the following: (40 points)



3- Boron and gallium elements belong to group while oxygen and selenium elements belong to group

4- Sodium reacts with hydrogen to form While it reacts with oxygen to form

5- Lithium reacts directly at room temperature with nitrogen to form

6- The common oxidation states for group III A are and while for group V A are, and

7- According to metallic character, Ge and Si are while Sn and Pb are

8- In group IV A, have the strongest ability to catenation while have the weakest ability to catenation.

9- The important compounds in which sulfur appears in a 4+ oxidation state are and

10- Structure of CO is isoelectronic with

11- Orthosilicate present in While pyrosilicate present in



13- is the highly reactive form for phosphorous while is the least reactive and the least soluble form.





17- White phosphorous reacts with limited supply of air to give
while it reacts with excess amount of oxygen to give

18- Produced by reaction of O_3 with potassium hydroxide.

19- are produced by dissolving silicon in molten metals.

20- The electronic configuration of radium iswhile for
phosphorus is

II- Explain the following by using equations: : (21 points)

1. Reactions of alkalimetals with water.
2. The preparation of hydrogen from amphoteric element.
3. Reactions of Be with non metals.
4. Preparation of phosphorous.
5. Preparation of carbon monoxide.
6. Preparation of halogens.
7. Lithium reacts with O_2 to form oxide (not peroxide).

III- Explain the following by drawing structures: : (9 points)

1. Allotropy of carbon
2. Quartz silicon dioxide.
3. The lewis formulas for the oxy chlorine acids.

With my best wishes

Department: Chemistry

Level: 3rd

Final Term: Spring 2015

Course title: Physical Chemistry of Macromolecules (C 457)

Time allowed: 2 hours.

Total points: 70

Professor: Dr. Howida Abouel Fetouh El Sayed



I. Choose the correct answer for these questions and fill in the Table

(10 points)

Question	1	2	3	4	5	6	7	8	9	10
Answer										

1. Dendritic polymer possess is (a. linear b. branched c. tree like) structure.
2. Elasticity is the ability of the polymer molecules (a. to form films b. to swell c. a, b).
3. The Gyroscopic method involves the relation (a. $\Delta T_f = k_f m$ b. $\Delta T_b = k_b m$ c. none of these).
4. Polymer chains of high kinetic flexibility have (a. low b. high c. medium) glass temperature.
5. The amorphous polymers have (a. melting temperature b. glass temperature c. neither a nor b) .
6. Below the glass temperature, the polymer becomes (a. hard b. glassy c. both a, b)
7. For Nylon 66, (a. Vander Waals b. hydrogen bonds c. both a, b) forces exist between the chains.
8. The degree of coiling of single polymeric chains depends on:
a. kinetic flexibility.
b. thermodynamic flexibility.
c. neither a nor b
9. PVC is (a. elastomer b. thermoplastic c. thermosetting) polymer.
10. The LDPE has (a. high b. low c. no) degree of branching.

II. Write right (✓) or wrong (x) besides each question and correct the wrong

(10 points)

1. The value of potential energy difference ΔU determines the kinetic flexibility of the polymer chains.
2. The rigid chains have thermodynamic flexibility but slow kinetic flexibility.
3. If the kinetic energy of polymer molecules less than potential energy barrier (U_0), the chains only vibrate.
4. As the molecular weight of polymer increases, possible conformational transformation decreases.
5. As the intermolecular forces in polymer chains increases, number of conformations increases.

6. The hindered rotation of the polymer chains causes rigidity.
7. The inorganic polymer of too high molecular weight possess a lot of applications.
8. The solubility of inorganic macromolecules decreases with increasing the molecular weight.
9. Aluminium chloride is (a. condensation polymer b. Coordination polymer c. neither a nor b).
10. As the number of polar groups in ploymers increases, the kinetic rigidity decreases.

III. Solve the following problem:

(5 points)

Sample of macromolecules (20 moles, molecular weight (M_w) =1000, 80 moles, M_w = 5000, and 10 moles, M_w =100000 g.mol⁻¹, calculate the number average molecular weight and weight average molecular weight.

IV. Discuss the following:

(30 points)

1. The rotation of ethane molecules.
2. Factors affecting the chain flexibility of macromolecules.
3. Molecular weight distribution of macromolecules.
4. Determination of average molecular weight of polymer by:
 - Osmometry
 - Viscomery
 - Ultracentrifugal method.
 - Sedimentation equilibrium method

V- Explain the following:

(15 points)

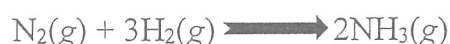
1. Micellar theory and molecular theory of solutions of macromolecules.
2. Sketch the relation between the degree of swelling of the polymer and the time.
3. Factors affecting the dissolution and swelling of the polymers.

Best Wishes!



Section One: Thermodynamics (35 Marks)

- (1) Compare between: (i) endothermic and exothermic processes occur through adiabatic and diathermic boundaries (ii) reversible expansion work in isothermal and adiabatic processes.
- (2) When 4 moles of $\text{NH}_3(\text{g})$ reacts completely with 3 moles $\text{O}_2(\text{g})$ to form 2 moles of $\text{N}_2(\text{g})$ and 6 moles of $\text{H}_2\text{O}(\text{g})$ at 25°C and 1 atm, 1267.2 kJ of energy is released as heat. Calculate ΔH and ΔU for this process.
- (3) Given that $\Delta H_f^\circ (\text{NH}_3) = -46 \text{ kJ/mol}$, $S^\circ = 192, 131, 193 \text{ J.mol}^{-1}.\text{K}^{-1}$ for N_2 , H_2 and NH_3 , Respectively, calculate ΔH° , ΔS° , and K (at 298 K) for the following reaction:

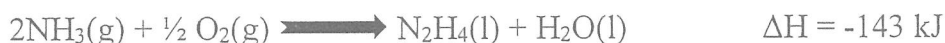
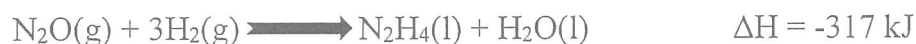
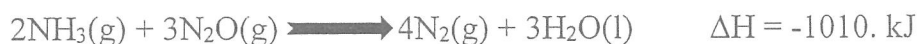


Calculate ΔG for this reaction under the following conditions

- a. $T = 298 \text{ K}$, $P_{\text{N}_2} = P_{\text{H}_2} = 200 \text{ atm}$, $P_{\text{NH}_3} = 50 \text{ atm}$
- b. $T = 298 \text{ K}$, $P_{\text{N}_2} = 200 \text{ atm}$, $P_{\text{H}_2} = 600 \text{ atm}$, $P_{\text{NH}_3} = 200 \text{ atm}$
- (4) Derive the relation between T , V and P for an ideal gas present in an adiabatic system. State how to calculate C_v , C_p and γ for an ideal gas.
- (5) Calculate ΔH for the reaction



given the following data:



- (6) Calculate the entropy change in the surroundings when 2 mol $\text{H}_2\text{O}(\text{l})$ is formed from its elements under standard conditions at 298 K, $\Delta H^\circ = -286 \text{ kJ}$.
- (7) What is the difference between Carnot engines, refrigerators and heat pumps?

$$[R = 8.314 \text{ J/mol.K} = 0.082 \text{ L.atm/mol.K} = 2 \text{ cal/mol.K}]$$

Go to next page



Section Two: Phase Rule (35 Marks)

- (1) Drive the phase rule equation.
(2) In which of the following equilibrium systems the phase rule equation could be applied?

Why? Calculate C, P and F in each case.

- (i) $\text{CaCO}_3(\text{s}) \rightleftharpoons \text{CaO}(\text{s}) + \text{CO}_2(\text{g})$
(ii) Sulfur (S_R , S_M , liq., vapor)
(iii) $\text{NH}_4\text{Cl}(\text{s}) \rightleftharpoons \text{NH}_3(\text{g}) + \text{HCl}(\text{g})$
(iv) $\text{CuSO}_4(\text{s}) \rightleftharpoons \text{CuSO}_4(\text{s}) + 5 \text{H}_2\text{O}(\text{l})$
(v) $3\text{H}_2(\text{g}) + \text{N}_2(\text{g}) \rightleftharpoons 2\text{NH}_3(\text{g})$
(vi) $3\text{Fe}(\text{s}) + 4\text{H}_2\text{O}(\text{g}) \rightleftharpoons \text{Fe}_3\text{O}_4(\text{s}) + 4\text{H}_2(\text{g})$
(vii) $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \rightleftharpoons 2\text{HCl}(\text{g})$

- (3) Explain with drawing the phase diagrams of water and sulfur systems?
(4) Define: Phase, component, variance, polymorphism and allotropy
(5) How do you explain the expansion occurs when water is freeze?
(6) Compare between Zeotropic and Azeotropic liquid mixtures?
(7) What is meant by supercritical fluid? When it could be obtained?
-

Good luck

Dr/ Gaber Hahsem

الامتحان مكون من ثلاثة صفحات

Q1: In a tabular form put which is (✓) and which is(x): (40 marks)

- 1- There are eight types of colloid solutions according to state of matter
- 2- Electro-dialysis is suitable to remove any impurities
- 3- Zig-Zag motion present in true solution
- 4- As viscosity of colloid solution increase Brownian displacement increase
- 5- Charge of protein colloid particles not depends on pH of medium
- 6- Mechanical dispersion method could be used for preparation of sulphur colloid sol
- 7- Coagulation value increase with increase the charge of ion
- 8- Lyophilic colloid must be charged either with negative or positive charge
- 9- Mean Brownian displacement not affected with temperature
- 10- Colloid particles size could be determined with ultra-microscope
- 11- Colloid solution of AgI in excess KI exhibit electro-osmosis towards negative electrode
- 12- Hydrochloric acid solution raises emulsion stability
- 13- Lyophobic colloid prepared by direct methods
- 14- Rate of nucleation directly proportional with particles surface area
- 15- Emulsifying agent raises surface tension between immiscible liquids
- 16- Color of colloidal sol depends on the particle size
- 17- Elastic gel must be prepared by chemical method only
- 18- Cottrell precipitator used in water treatment
- 19- Lyophilic colloid is less stable than lyophobic one
- 20- Lyophobic colloid require less amount of electrolyte for precipitation compared with lyophilic one

Q1 Answer:

(Number)	(Answer)	(Number)	(Answer)	(Number)	(Answer)	(Number)	(Answer)
1		6		11		16	
2		7		12		17	
3		8		13		18	
4		9		14		19	
5		10		15		20	

Q2: In a tabular form choose the correct answer:

(10 marks)

1- Used in preparation of Nano zinc oxide:

(a) Zinc acetate (b) Zinc sulphide (c) Soap (d) Silver nitrate

2- Car painting is a direct application for:

(a) Electrophoresis (b) Electro-osmosis (c) Tyndall effect (d) Ficks law

3-Conversion of semi-solid into liquid with shaking called:

(a) Thixotropy (b) Shrinking (c) Syneresis (d) Protection

4- Colloid solution of liquid in liquid called:

(a) Emulsion (b) Sols (c) Foam (d) Gels

5-Used in purification of water:

(a) Ferric alum (b) Acetic acid (c) None of the above (d) Tannin

Q2: Answer:

Number	1	2	3	4	5
Answer					

Q3: Show with diagram only (complete data on the figure): (20 marks)

1- Cottrell precipitator

2-Bredig's arc method

3-Electrical double layer

4-Mechanical grinder

Answer:

1	2
3	4

With my best wishes

A.F.Hassan

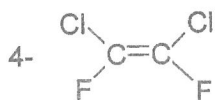
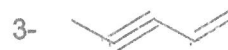
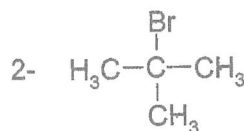
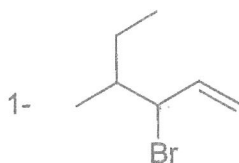
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Question (1)

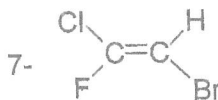
(24 mark)

A- Give The IUPAC name for the following compounds:



5- Ethyl acetylene

6- Allyl chloride



B- Discuss the mechanism of the following reactions

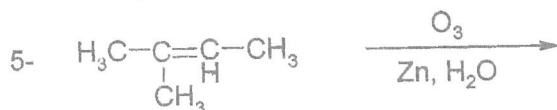
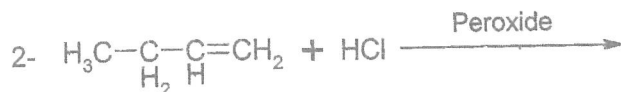
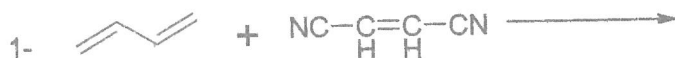
1- Addition of HBr to propene in the presence of peroxide.

2- Reaction of tert-butyl chloride with water indicating the type of reaction

Question (2)

(22 mark)

A- Complete the following equations and name all the products:



B- How to convert the following?

1- tert-butyl alcohol to 2-methylpropanol.

2- Propene to acetone.

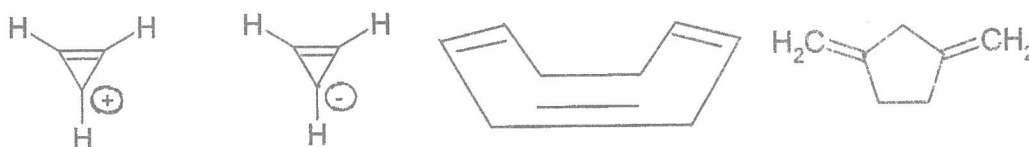
3- Ethanol to 1,1-dibromoethane.

4- Acetylene to 1,3,5-trimethyl benzene.

Question (3)

(24 mark)

1- Predict which of the following aromatic and which non-aromatic, give reasons.



2- Cyclopentadienyl anion is an aromatic compound. Write all its resonance structures.

3- Write all resonance for the arenium ions that would be resulted from nitronium ion attack on ortho, meta and para positions of phenol. Which arenium ions are the more stable?

4- Arrange the following compounds according to the increase of order of bromination.

Anisole, nitrobenzene, chlorobenzene, aniline, benzene, benzene sulfonic acid.

5- When benzene reacts with n-propyl chloride in the presence of AlCl_3 , major product (A) and minor (B) are obtained. Write a mechanism and indicate how can you obtain only (B) from benzene.

6- Starting with benzene, how can you synthesize:

m-bromonitrobenzene, p-chlorobenzene sulfonic acid, o-chloronitrobenzene, m-chlorobenzophenone.

Good luck

Exam in the Spectroscopy (C441)

Answer the following questions:

[1] Select the correct answer for each of the following statements:

16 Marks

(i) The number of peaks in the ^{13}C -NMR spectrum of 1,4-dimethylbenzene is:

- a) Two b) three c) four d) five

(ii) The ^1H -NMR spectrum of diethyl ether shows?

- a) two peaks, one a triplet, the other a quartet b) four peaks, all doublets
c) two peaks, one a triplet, the other a doublet d) four peaks, all triplets

(iii) Four $\text{C}_{10}\text{H}_{14}$ isomers are named below. Which of these would display the following ^1H -NMR signals? δ 1.22 (t) 6H, δ 2.60 (q) 4H, δ 7.12 (s) 4H

(s=singlet, d=doublet, t=triplet, q=quartet, m=multiplet).

- a) tert-butylbenzene. b) isobutylbenzene
c) para-diethylbenzene. d) 1,2,3,4-tetramethylbenzene.

(iv) Which if any of the following compounds will display spin-spin splitting in the ^1H -NMR?

- a) $(\text{CH}_3)_3\text{CCOCH}_3$ b) $\text{Br}(\text{CH}_2)_3\text{Br}$
c) CH_3OCH_3 d) none of these

[2] How IR spectroscopy can be used to distinguish each pair of the following:

- i) $\text{CH}_3\text{CH}_2\text{-OH}$ and CH_3OCH_3
ii) $\text{C}_6\text{H}_5\text{NHCH}_3$ and $\text{C}_6\text{H}_5\text{CONH}_2$

14 Marks

[3] How could you distinguish between each pair of the following based on the number of signals in the ^{13}C -NMR spectrum.

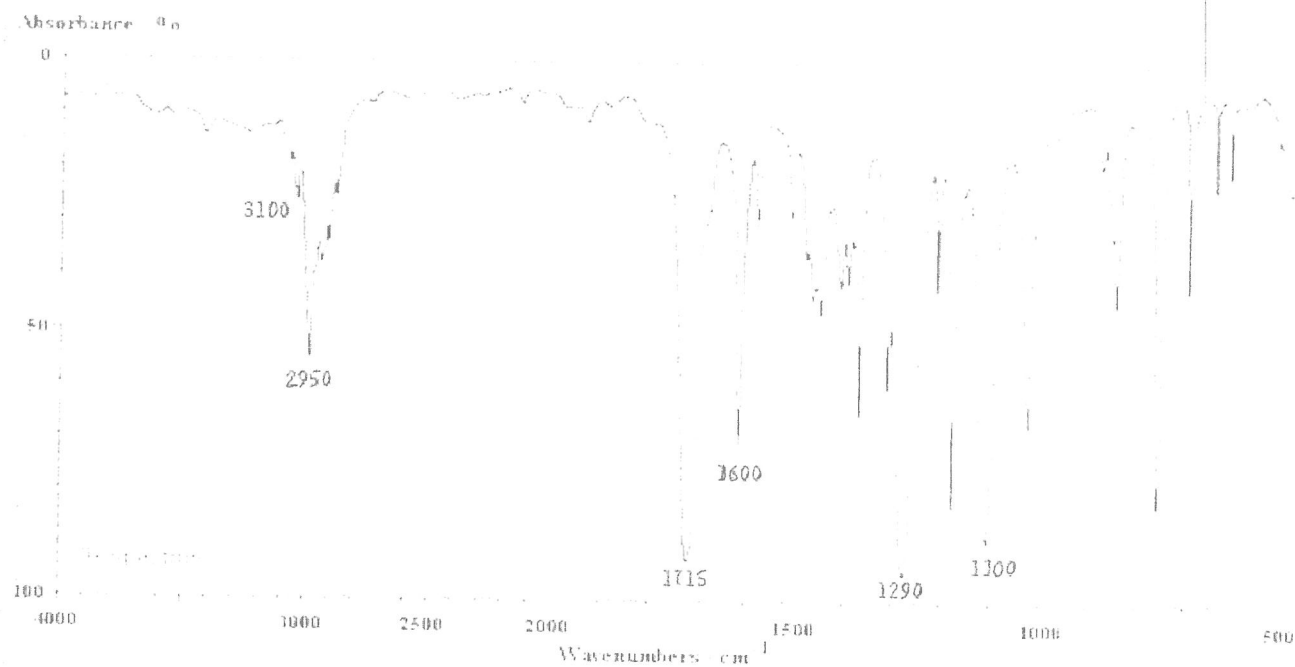
14 Marks

- a) CH_3COCH_3 and $\text{CH}_3\text{COOCH}_3$
b) $\text{CH}_3\text{CH}_2\text{CH=CHCH}_2\text{CH}_3$ and $\text{CH}_3\text{CH=CHCH}_2\text{CH}_2\text{CH}_3$

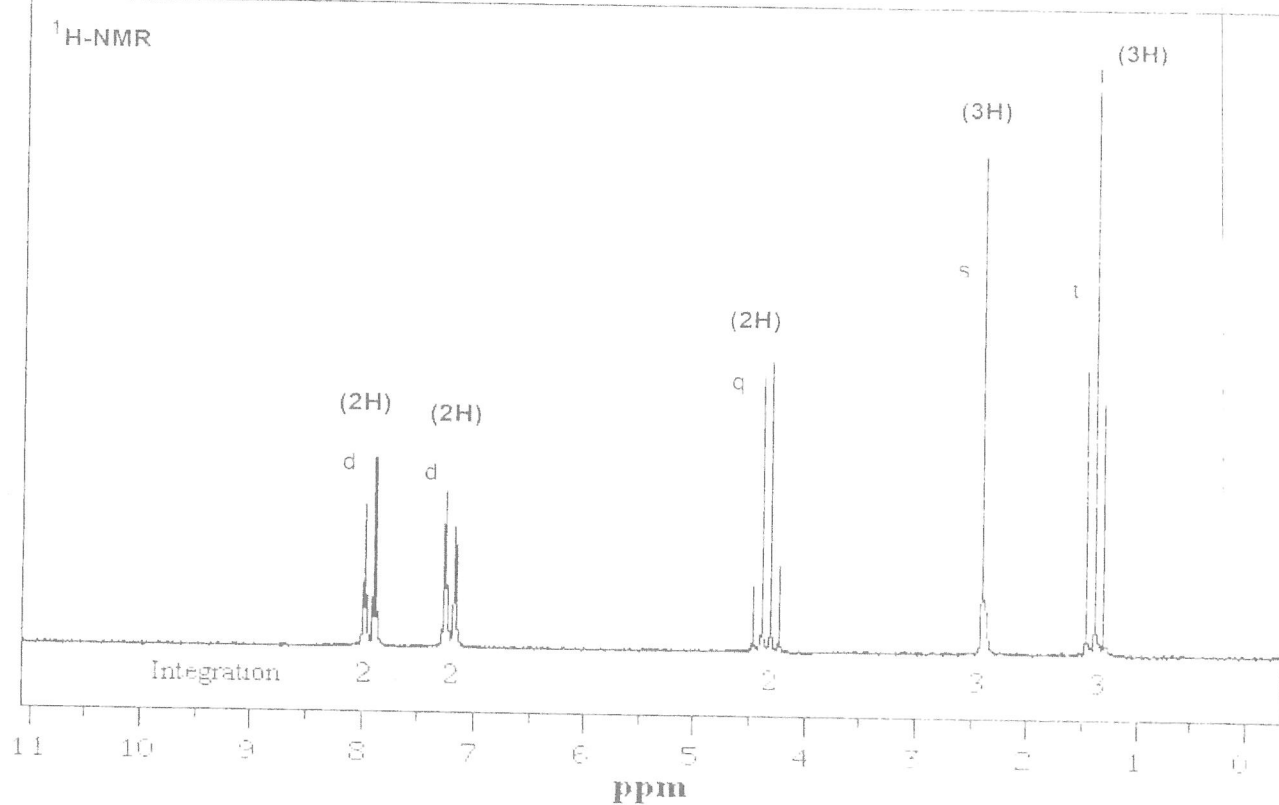
[4] Predict the structural formula for a compound of molecular formula $C_{10}H_{12}O$ and give reasons.

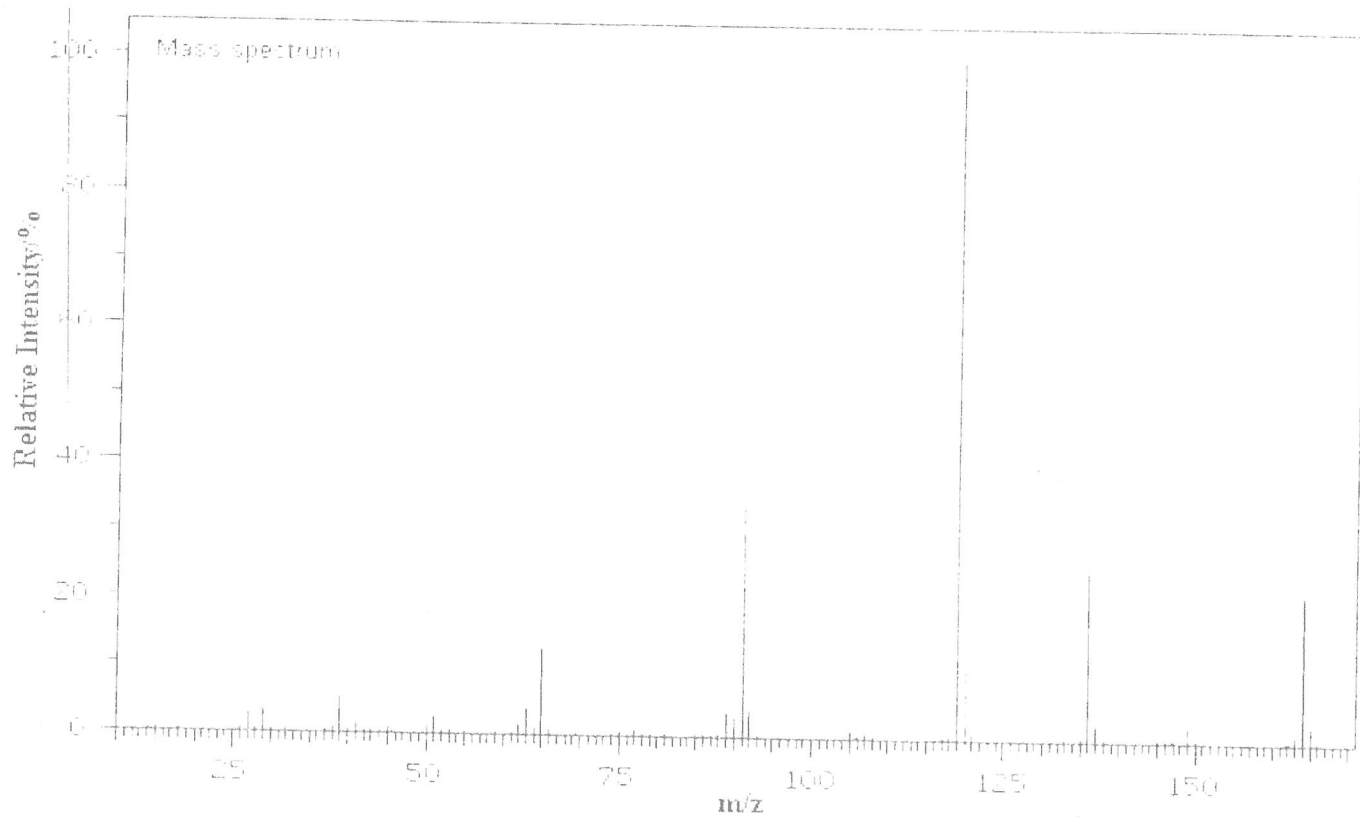
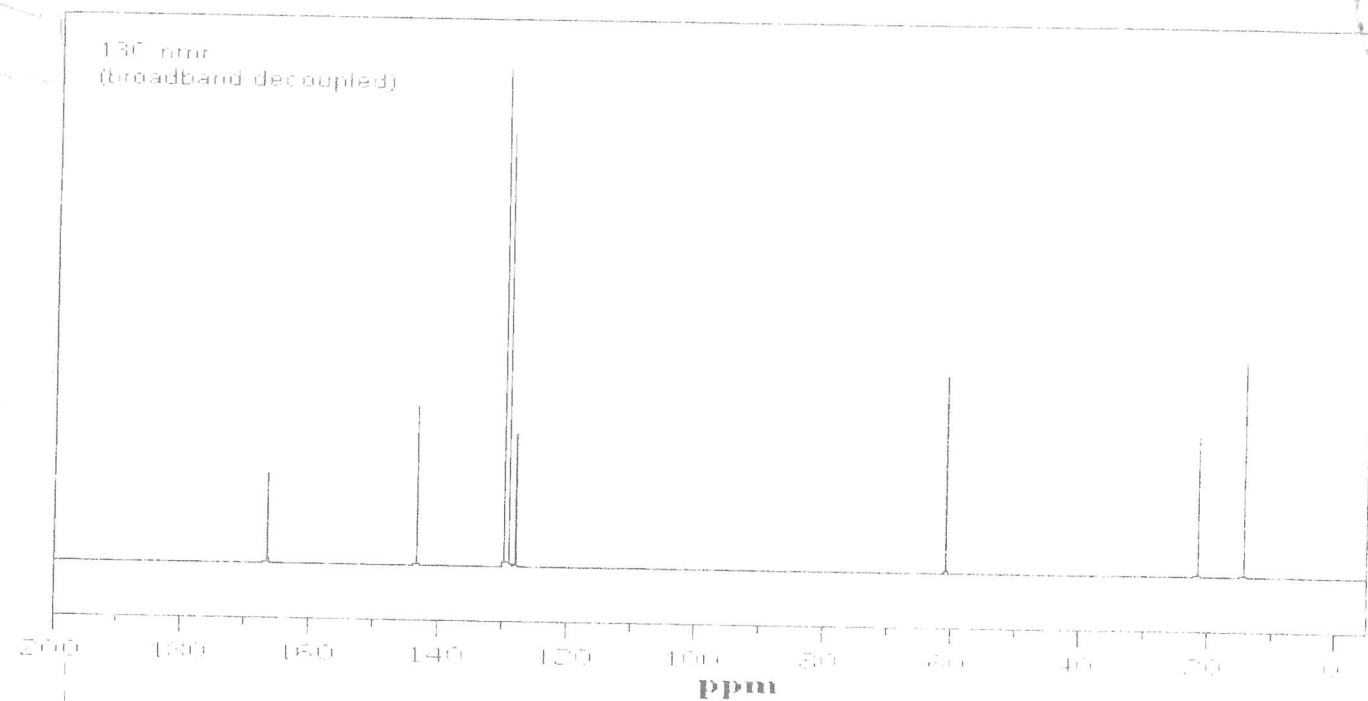
26 Marks

IR



1H -NMR





Good Luck Dr./ Mohamed Abd El-Latif